REMARKS

Claims 1, 3-6, 8-14, 16-23, 25, 27-30, 32-38 and 40-47 are in the case and presented for reconsideration. Claims 2, 7, 15, 24, 26, 31, 39 and 48 have been canceled. Claims 1, 4, 8, 16, 25, 28, 32 and 40 have been amended. No new matter has been added.

The drawings have been objected to under 37 C.F.R. § 1.84(p)(5). The Examiner has indicated that a number of reference characters (see listing) cannot be found in "in figures 3A, 3B, 4, 5, 9A and 9B." This objection is believed to be in error since the present application only contains Figs. 1, 2, 3, 4, 5A and 5B and not the particular figures identified by the Examiner. Additionally, although reference character "54" is the only reference character listed by the Examiner that is actually utilized in the present application, it is clear that reference character No. 54 is clearly identified in both the drawings and the specification. See for example, Specification Page 18, Lines 26-28 and Figs. 2 and 3 for the present application. Accordingly, since the drawings for the present application are clearly in compliance with 37 C.F.R. § 1.84(p)(5), this objection should be withdrawn.

Claims 1, 14 and 19 have been rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-19 of U.S. Patent No. 6,373,240. Contrary to the Examiner's statement, Claims 1, 14 and 19 of the present application are clearly patentably distinct and not anticipated by Claims 1-19 of the '240 patent. Upon careful review of the claimed subject matter of Claims 1, 14 and 19 of the present application in comparison to Claims 1-19 of the '240 patent, one can easily see that these claims are neither described or suggested by Claims 1-19 of the '240 patent.

Particularly, Claim 1 of the present application is directed toward an apparatus for determining the position of an object within a body of a subject comprising at least one acoustic wave generator for directing a first acoustic wave toward the body at a first frequency; an acoustic tag adapted to be fixed to the object wherein the tag comprises a shell defining a cavity therein and a medium contained within the shell such that responsive to incidents thereon of the first acoustic wave and, the tag emits a second acoustic wave at a second frequency wherein the

second frequency is different from the first frequency; one or more detectors adapted to detect the second acoustic wave and to generate signals responsive thereto; and a signal processor coupled to process the signals so as to determine coordinates of the object in the body.

Claim 14 of the present application depends from Claim 13 wherein Claim 14 distinctly claims that the magnetostrictive element is shaped to as to focus the electromagnetic radiation that it emits. Note that Claim 13 depends directly from independent Claim 8 and distinctly claims that the transducer comprises a magnetostrictive element which is shaped so as to respond anisotropically to the acoustic waves and independent Claim 8 is directed toward an apparatus for determining the position of an object within a body of a subject comprising at least one acoustic wave generator for directing acoustic waves toward the body; a transducer adapted to be fixed to the object and constructed to emit electromagnetic radiation responsive to the acoustic waves with a response that varies depending on an orientation angle of the transducer relative to the at least one acoustic wave generator; one or more detectors adapted to detect the electromagnetic radiation emitted by the transducer and to generate signals responsive thereto; and a signal processor coupled to process the signals so as to determine an angular orientation coordinate of the object in the body.

Claim 19 of the present application is dependent upon Claim 18 (which depends upon Claim 17 which depends upon independent Claim 16) wherein Claim 19 is directed to the circuit elements comprising coils having different, respective values of inductance.

Thus, it is clear that Claims 1, 14 and 19 of the present application are not related in any manner to the claims of the '240 patent. Particularly, of the '240 patent is directed toward a method for tracking an object comprising producing an unperturbed energy field at a plurality of predetermined frequencies in the vicinity of the object; measuring a baseline phase value of each of the plurality of resulted signals at the respective plurality of predetermined frequencies before introduction of the article; determining a characteristic of a perturbing energy field induced responsive to the unperturbed field due to introduction of an article responsive to the unperturbed field to the vicinity of the object; receiving a plurality of resultant signals responsive to the unperturbed and perturbing energy fields generated at a location of the object after

introduction of the article; measuring a phase shift total at the respective plurality of predetermined frequencies after introduction of the article so that the parameter comprises a term for each of the plurality of predetermined frequencies; determining an optimal frequency for the unperturbed energy field from amongst the plurality of predetermined frequencies responsive to a parameter of the resultant signals by determining a frequency at which the term is a minimum; and determining spatial coordinates of the object responsive to the resultant signal at the optimal frequency. Additionally, independent Claim 8 of the '240 patent is directed to a method for tracking an object; independent Claim 11 of the '240 patent is directed to an object tracking apparatus; and independent Claim 18 of the '240 patent is also directed toward an object tracking apparatus wherein each of these independent claims and their dependent claims therefrom are concerned with either perturbing energy fields, a phaser and a phase (independent 8); or determining an optimal frequency for the energy field from amongst a plurality of predetermined frequency based on a baseline phase value, a phase shift, etc. (independent Claim 11); or signal processing circuitry assuming a phaser of a signal responsive to the unperturbed energy field and a phaser of a signal responsive to the perturbing energy field and assuming a phase for the signal responsive to the unperturbed energy field and a phase for the signal responsive to the perturbing energy field to be linearly dependent on the plurality of predetermined frequencies (independent Claim 18).

Accordingly, upon careful reading of the inventions claimed in the present application as compared to the independent claims of the '240 patent, there is absolutely no basis for an anticipation rejection or an obviousness rejection. Thus, this double patenting rejection is not warranted and should be removed.

Claims 1, 7, 14 and 19 have been rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-19 of U.S. Patent No. 6,223,066. Claims 1, 14 and 19 of the present application have been outlined previously above. Claim 7 of the present application is a dependent claim dependent directly from independent Claim 4 and specifically claims that there is substantially no wired connection to the tag introduced in independent Claim 4 wherein independent Claim 4 is directed toward an apparatus for determining the position of an object within a body of a subject comprising at least one

acoustic wave generator for directing acoustic waves toward the body over the range of frequencies including at least first and second frequencies; an acoustic tag adapted to be fixed to the object wherein the tag is constructed so as to reflect the acoustic waves at the first frequency with a first spatial pattern of intensity variation and to reflect the acoustic waves at the second frequency with a second spatial pattern of intensity variation; one or more detectors adapted to detect the reflected acoustic waves and to generate signals responsive thereto; and a signal processor coupled to process the signals so as to determine an angular orientation coordinate of the object in the body responsive to a difference between the first and second spatial patterns.

Claims 1-19 of the '066 patent are directed to both apparatus and method for determining the position of an object utilizing magnetic-field responsive optical element fixed or coupled to the object; a light source (which is used to inject light into the magnetic field-responsive optical element) and modulation of the light responsive to an external AC magnetic field as well as a detector which generates signals at least a portion of the modulated light from magnetic field and signal processing circuitry which receives the signals from the detector and processes the signals to determine the position of the object.

Since Claims 1, 7, 14 and 19 of the present application are directed toward object position determination utilizing at least one acoustic wave generator and a transducer fixed to the constructed to emit electromagnetic radiation responsive to the acoustic waves and the claims of the '066 patent are directed to using a magnetic-field responsive optical element and light modulation, it is clear that Claims 1, 7, 14 and 19 of the present application are neither anticipated nor rendered obvious by the claims of the '066 patent. Accordingly, this double patenting rejection is clearly without basis and the rejection should be withdrawn.

Claims 1, 12-14, 19, 28 and 29 have been rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1 and 13 of U.S. Patent No. 6,688,967. Claims 1, 14 and 19 of the present application have been outlined previously above. Claims 12 and 13 are both dependent claims respectively depending on independent Claim 8 wherein Claim 12 distinctly claims that the signal processor is further adapted to determine position coordinates of the object responsive to the signals and Claim 13 distinctly

claims that the transducer comprises a magnetostrictive element which is shaped so as to respond anisotropically to the acoustic waves. The apparatus of independent claim 8 has also been outlined previously above.

Claim 28 of the present application is directed to a method for determining the position of an object within a body of a subject comprising fixing an acoustic tag to the object when the tag is constructed so as to reflect acoustic waves at a first frequency with a first spatial pattern of intensity variation and to reflect acoustic waves at a second frequency with a second spatial pattern of intensity of variation; inserting the object into the body of the subject; directing the acoustic waves toward the body over a range of frequencies including at least the first and second frequencies; detecting the reflected acoustic waves generating signals responsive thereto; and processing the signal so as to determine an angular orientation coordinate of the object in the body responsive to a difference between the first and second spatial patterns. Claim 29 of the present application depends directly from independent Claim 28 and claims processing the signals further comprises determining position coordinates of the object responsive to the signals.

Claims 1 and 13 of the '967 patent are directed toward a system and method for treating a patient's heart utilizing a catheter that is placed in the heart wherein the catheter has an active portion of the distal end of the catheter for applying laser energy operable to ablate a portion of the heart; a position sensor responsive to magnetic fields for generating signals for determining position and orientation coordinates of the catheter distal end; and a signal processor used for reconstructing a 3-dimensional surface representing a surface of the patient's heart based on signals received from the position sensor and for generating a map on the 3-dimensional surface showing sensed electrical signals generated by the heart. As one can clearly see, the claimed invention of the present application and Claims 1 and 13 of the '967 patent are completely unrelated and are directed toward claimed inventions patentably distinct from each other. Since the claims of the present application relate in some way to acoustic wave generation or acoustic wave emission and the claims of the '967 patent relate to heart mapping, 3-dimensional surface reconstruction and laser ablation, it is clear that the claims of the present application are neither

anticipated by nor rendered obvious by the claims of the '967 patent. Accordingly, this double patenting rejection is without basis and should be withdrawn.

Claims 19, 28 and 29 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-30 of U.S. Patent No. 6,332,089. Claims 19, 28 and 29 of the present application have been outlined previously above. Claims 1-30 of the '089 patent are directed toward a method of guiding the probe in the body of a patient comprising the steps of providing a site probe at a site within the body of a patient and providing an instrument probe to guide it within the body of the patient; transmitting one or more non-ionizing fields to or from each of the said probes and detecting each such transmitted field; and determining the relative disposition of the instrument probe and the site probe by determining a position of each probe in a common frame of reference based on the properties of the detected fields and determining the relative disposition based upon the so-determined positions and directing the instrument probe toward the site probe based on relative deposition.

Based on a careful review of the exact claim language, it is clear that Claims 1-30 of the '089 patent are directed toward methods for guiding an instrument probe toward a site probe in the body, and as one can clearly see, this invention has absolutely nothing to do with the Applicant's claimed invention of Claims 19, 28 and 29 of the present application. Accordingly, Claims 19, 28 and 29 of the present application are neither anticipated by nor rendered obvious by the claims of the '089 patent. Therefore, this double patenting rejection is improper and should be withdrawn.

The Examiner has also indicated that an objection under 37 C.F.R. § 1.75 will occur if claims 1, 2 and 3 are found to be allowable in view of Claims 14, 16 and 17 since the Examiner considers these claims to be "substantial duplicates thereof." A closer review of each of these claims clearly shows that each claim claims subject matter that is uniquely different and in no way could ever be considered substantial duplicates of each other. Accordingly, this type of objection is clearly without basis.

Independent Claims 1, 4, 8, 16, 25, 28, 32 and 40 of the present application have been amended in order to more particularly point out that the acoustic tag (Claims 1, 4, 25 and 28) or transducer (Claims 8, 16, 32, and 40) are wireless acoustic tags or wireless transducers respectively. Thus, each independent claim of the present application is directed toward an apparatus within a body of a subject that uses either at least one acoustic wave generator for directing a first acoustic wave toward the body at a first frequency and a wireless acoustic tag responsive to the first acoustic wave wherein the tag emits a second acoustic wave at a second frequency wherein the second frequency is different from the first frequency; one or more detectors adapted to detect reflected acoustic waves and to generate signals responsive thereto; and a signal processor for processing the signals so as to determine coordinates of the object in the body (see independent Claims 1, 4, 25 and 28).

Additionally, the claimed present invention as set forth in independent Claims 8 and 30 is directed toward an apparatus and method for determining the position of an object within the body of a subject comprising at least one acoustic wave generator for directing acoustic waves toward the body and a wireless transducer fixed to the object and constructed to emit electromagnetic radiation responsive to the acoustic wave with a response that varies depending on orientation angle of the transducer relative to the at least one acoustic wave generator; one or more detectors for detecting the electromagnetic radiation emitted by the wireless transducer and generating signals responsive thereto; and a signal processor for determining an angular coordinate of the object in the body.

Independent Claims 16 and 40 of the Applicant's present invention is directed toward an apparatus and method respectively for determining the position of an object within a body of a subject comprising at least one field generator for generating an electromagnetic field within the body and a wireless transducer fixed to the object and constructed to emit acoustic waves responsive to the electromagnetic field; one or more acoustic trip detectors for detecting the acoustic waves emitted by the transducer and to generate signals responsive thereto; and a signal processor for processing the signals so as to determine coordinates of the object in a body.

Turning now to the rejections based on the cited prior art references, Claims 1, 2, 7, 12-16, 19, 28 and 29 have been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,226,547 (Lockhart et al.). Claims 1, 3-12, 14, 15 and 17-27 have been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,490,474 (Willis et al.). Claims 3, 6, 17, 18, 20 and 23 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Lockhart et al. in view of Willis et al. Claims 8 and 25 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Lockhart et al. in view of Willis et al. as set forth above and further in view of U.S. Patent No. 5, 437,277 (Dumoulin et al.). Claims 8, 10, 11, 25 and 27 have been rejected under 35 U.S.C. § 103(a) as being unpatenable over Lockhart et al. in view of Willis et al. as set forth above and further in view of U.S. Patent No. 6,239,724 (Doron et al.). Claims 2 and 16 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Willis et al. in view of Dumoulin et al.

Closer review of each of these cited prior art references clearly shows that none of these references either alone or in combination with each other describe, suggest or even infer the novel claimed invention as outlined above.

Particularly, Lockhart et al. is directed toward a catheter tracking system utilizing a plurality of magnetic field transducers wherein these magnetic field transducers operate as magnetic field generators or as magnetic field detectors. Column 2, Line 37 – Column 3, Line 10. This reference does not address in anyway the use of at least one acoustic wave generator in connection with a wireless acoustic tag (such as distinctly claimed in Claims 1, 4, 25 and 28 of the Applicant's claimed present invention) or at least one field generator for generating an electromagnetic field within the body in combination with a wireless transducer fixed to an object constructed to emit acoustic waves responsive to the electromagnetic field (such as distinctly claimed in independent claims 16 and 40 of the Applicant's claimed present invention) or at least one acoustic wave generator for directing acoustic waves toward the body in combination with a wireless transducer for emitting electromagnetic radiation responsive to the acoustic wave with a response that varies depending on an orientation angle of the transducer relative to the at least one acoustic wave generator (such as distinctly claimed in independent Claims 8 and 32 of the Applicant's claimed present invention). Thus, there is absolutely no

teaching in Lockhart et al. that describes or suggests the unique combination of elements found in the Applicant's claimed present invention.

Willis et al. is directed toward a system and method for electrode localization using ultrasound. The Willis et al. system utilizes a plurality of catheters wherein each catheter has a plurality of ultrasound transducers positioned at its distal end wherein the transducers on these catheters are used to determine the relative positions of these catheters in the body using triangulation. Column 6, Lines 48-65. Moreover, the plurality of transducers used in the Willis et al. devices are piezoelectric transducers using a pair of electrodes 20 positioned on the inner and outer surface of the transducer material (ceramic). Column 7, Lines 16-26. Additionally, as taught by Willis et al. electrode leads are attached to the inner and outer transducer electrodes (20). Column 7, Lines 65-67. Moreover, the Willis et al. reference clearly points out the criticality of having to use leads for its piezoelectric transducer system wherein the reference warns that:

> It is important that the leads be attached using a minimum amount of material to minimize distortion of the acoustic field. Column 8, Lines 4-6.

It is important to note that Willis et al. does not address in anyway the wireless acoustic tag or wireless transducer and in no way does this reference describe, suggest or even infer an apparatus or method having the claimed elements or method steps for the Applicant's claimed present invention as outlined above.

Dumoulin et al. is directed toward inductively coupled RF tracking system for use in invasive imaging of a living body having a specific arrangement comprising an invasive device having a communicating coil which communicates with an inductive coil by electrical induction utilized in a retaining means which holds an equipment end of the invasive device. Column 2, Lines 43-58. Additionally, leads are also used in the invasive device in order to conduct the signal to the distal end of the device inside the patient. Column 2, Lines 58-60.

Doron et al. is directed toward a system and method for telemetrically providing intrabody spatial position wherein the system utilized a telemetry unit having separate

transducers 106, 110 and 111. Column 9, Lines 55-58. Each of the transducers 106, 110 and 111 each have a specific function respectively such as converting a power signal received from outside the body into electrical power for powering the implantable telemetry unit 102, receiving a positioning field signal which is transmitted from the outside of the body and transmitting a locating signal which is transmitted outside the body of the patient in response to a positioning field signal respectively. Thus, the specific system and transducer arrangement taught by Doron et al. is not related in anyway to the Applicant's claimed present invention.

Accordingly, it is clear that none of these cited prior art references, either alone or in combination with each other, describe, suggest or even infer the Applicant's claimed present invention. Therefore, by this Amendment and for the reasons outlined above, the claimed present invention is neither anticipated by nor rendered obvious by these prior art references and favorable action is respectively requested.

Respectfully submitted,

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